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Fig. 1

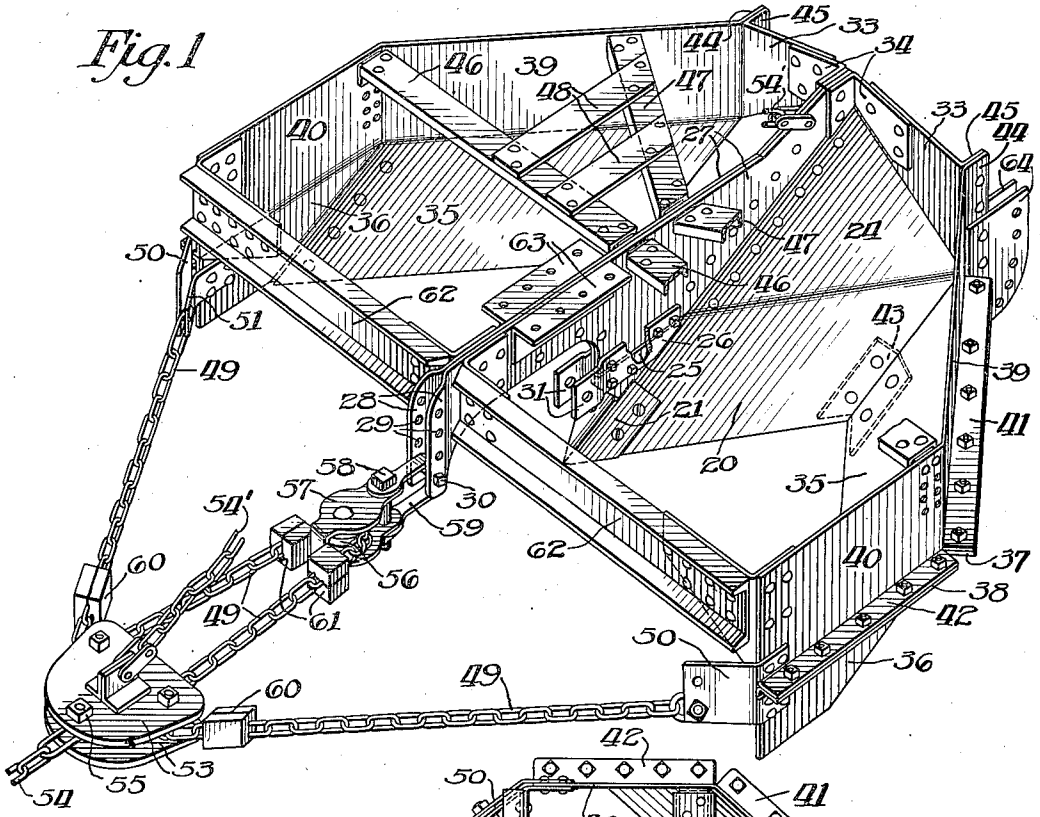


Fig. 2

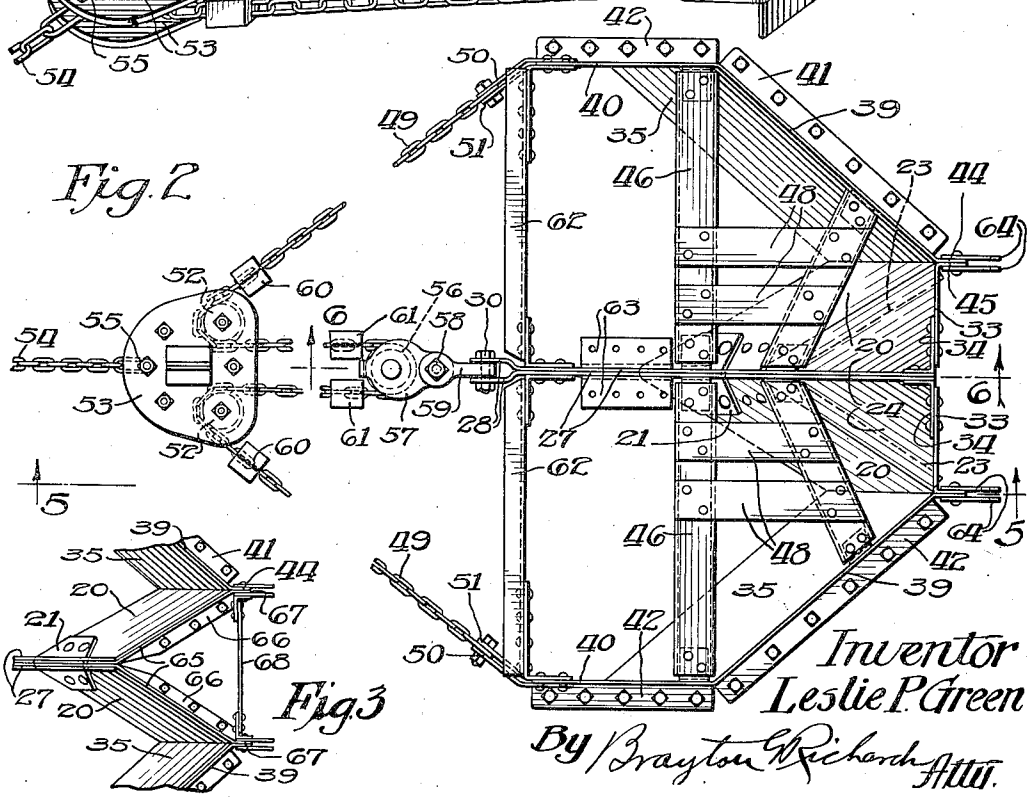


Fig. 3

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Fig. 7

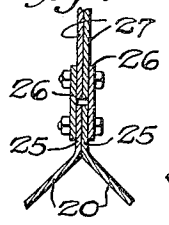


Fig. 8

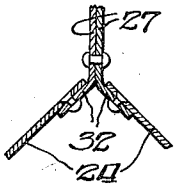


Fig. 4

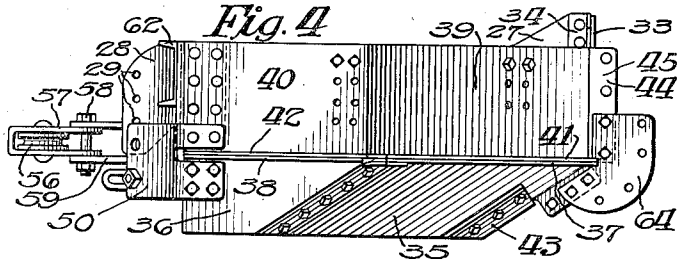


Fig. 5

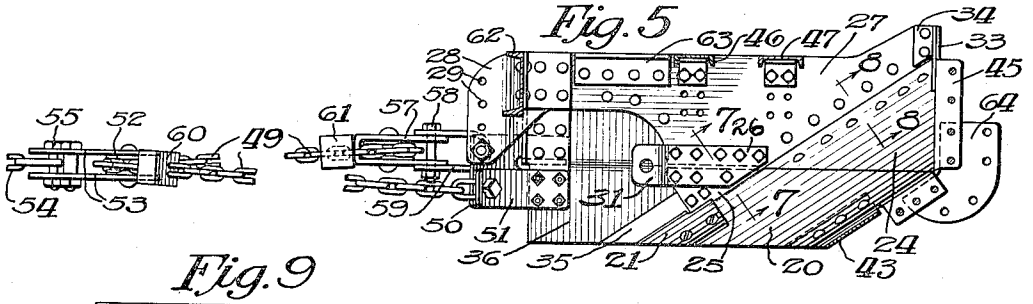


Fig. 9

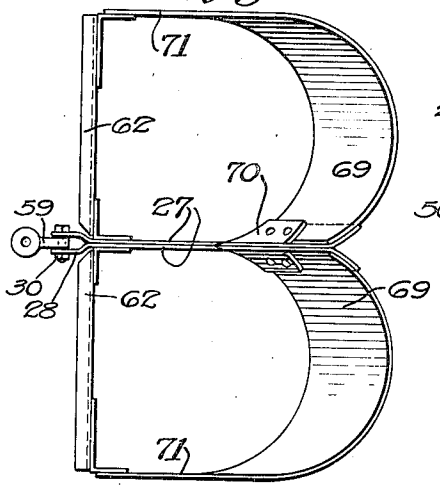


Fig. 6

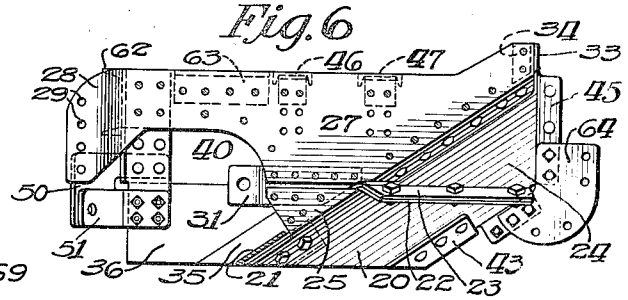


Fig. 10

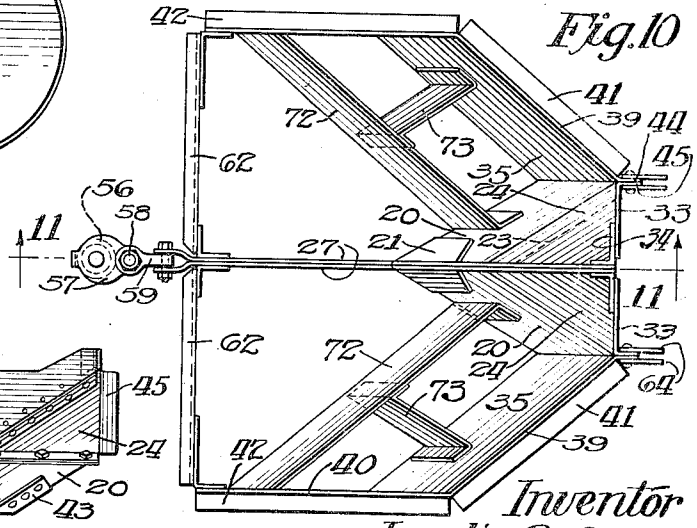
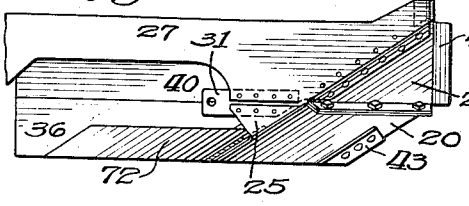


Fig. 11



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Fig. 12

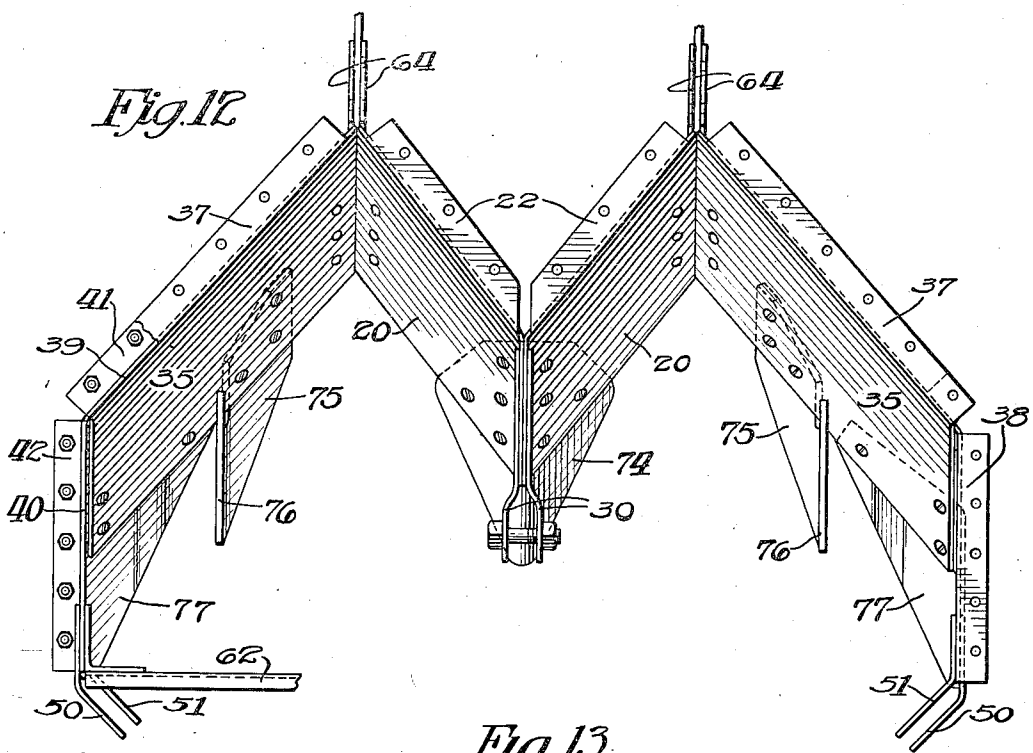


Fig. 13

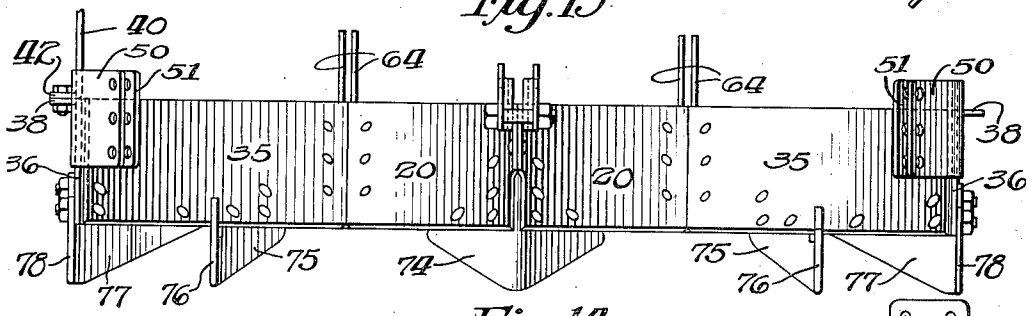
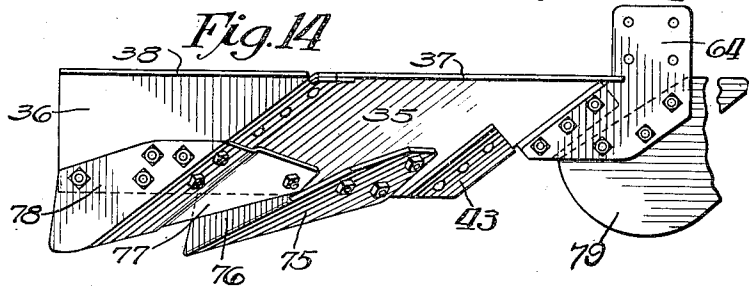


Fig. 14



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UNITED STATES PATENT OFFICE

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SCRAPER

Leslie P. Green, Chicago, Ill.

Application April 15, 1935, Serial No. 16,369

7 Claims. (Cl. 37—147)

The invention relates to improvements in scrapers and has for its primary object the provision of an improved construction of this character capable of economical production, and highly efficient in use.

Another object of the invention is the provision of a construction of the character indicated, so constructed and arranged as to provide a scraper structure of maximum strength and minimum weight.

Another object of the invention is the provision of a scraper of the character indicated, so constructed and arranged as to facilitate the under-cutting of banks. Other objects will appear hereinafter.

The invention consists in the combinations and arrangement of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming part of this specification and in which—

Fig. 1 is a perspective view of a scraper embodying the invention;

Fig. 2, a top plan view of the same;

Fig. 3, a top plan view of the central portion of a slightly modified form of construction;

Fig. 4, a side view of the form of scraper shown in Figs. 1 and 2;

Fig. 5, a section taken substantially on line 5—5 of Fig. 2;

Fig. 6, a section taken substantially on line 6—6 of Fig. 2;

Fig. 7, an enlarged partial section taken substantially on line 7—7 of Fig. 5;

Fig. 8, an enlarged partial section taken substantially on line 8—8 of Fig. 5;

Fig. 9, a top plan view of a modified form of construction, with cover elements removed.

Fig. 10, a top plan view of another modified form of construction;

Fig. 11, a longitudinal section of the construction shown in Fig. 10;

Fig. 12, a top plan view of the bottom portion of the scraper showing another slight modification;

Fig. 13, a front view corresponding with Fig. 12; and

Fig. 14, a side view of the construction shown in Fig. 12.

The embodiment of the invention illustrated in Figs. 1, 2, 4, 5, 6, 7, and 8, comprises a central digging element consisting of lower upwardly and rearwardly inclined digging or scraping plates **20**, arranged as shown to converge forwardly toward each other to form a digging or scraping point substantially in the form of a rooter plow, said plates **20** being secured to each other at their forward ends by means of a plow-like member **21**. Each of the plates **20** is provided at its upper rear edge with a securing flange **22** bolted, as best shown in Fig. 6, to a securing flange **23** at the lower edge of an upper plate **24**, arranged as shown to constitute a substantial upper continuation of the corresponding plate **20**. Each of the plates **20** is also provided at its upper forward edge with a securing flange **25** secured to the other by means of securing plates **26**, as best shown in Fig. 7. The securing plates **26** also serve as means for securing together the corresponding edges of two adjacent draft plates **27**, substantially in the form of and serving substantially the function of a plow-beam. The plates **27** are further secured to each other by numerous rivets and are provided at their forward ends with spaced lips or flanges **28** provided with bolt holes **29** for the reception of a shackle bolt **30** for draft purposes. The plates **26** are also extended at their forward ends and provided as shown with spaced perforated lips or ears **31** for the reception of the shackle bolt **30** when desired to make a draft connection therewith. At their rear upper edges, the plates **24** are provided with vertical flanges or walls **33** secured to the rear upper ends of the plates **27** by means of angle plates **34**, as shown. By this arrangement a central scraping element is provided which is adapted and arranged to act substantially as a rooter plow, when drawn forwardly, digging up and throwing material in opposite directions.

Connected with the rear edge of each of the plates **20** is a forwardly and outwardly extending, and upwardly and rearwardly inclined digging or scraping plate **35**, provided at its forward end with a vertical extension **36** as shown.

Each of the plates **35** and its extension **36** is provided respectively at its upper end with securing flanges **37** and **38**. Arranged above the plates **35** and **36** are vertical plates and extensions **39** and **40** secured respectively to flanges **37** and **38** by means of flanges **41** and **42** as shown. The plates **20** and **35** are secured at their rear edges by means of angle plates **43**, and plates **39** and **33** are secured to each other by means of vertical securing flanges **44** and **45**.

By this arrangement a scraper body is provided which may be made of comparatively thin or light plates and yet will have maximum strength and in which the lower digging or scrap-

ing elements are readily detachable for renewal or repairs.

Combined cross-bracing and cover elements **46** are adjustably secured as shown between the rear portions of the plates **40** and the central portions of the plates **27**. Additional bracing and cover elements **47** are also adjustably secured as shown, between the plates **39** and the plates **27**, and additional longitudinal plates **48** are arranged as shown between the members **46** and **47**. These cover elements **46**, **47** and **48** are thus separately adjustable in the opposite sides of the scraper body so that they may, when desired, be arranged at different heights or elevations therein. Thus, if desired, one of these cover elements may be adjusted at a lower level than the other so that the material gathered in that side of the scraper will contact therewith before the material in the other side contacts with the cover elements therein. As soon as the gathered material in the first side of the scraper contacts substantially with the lower cover elements therein, that side of the scraper will cease digging, while the other side will continue digging until the gathered material contacts with the under-sides of its cover elements. Thus the scraper may be caused to remove more material from one side of a trench than the other, whereby a trench with a sloping bottom will be formed. If such a trench is formed at the foot of a bank with its bottom sloping toward the bank, there will be a tendency to cause the scraper to dig into or under-cut the bank, which is highly desirable under certain conditions. This is due to the fact that if the side of the scraper next to the bank removes more material than the other side, this necessarily forms a bottom to the trench sloping toward the bank so that the scraper tends to progress into the bank, thereby undercutting the same. Obviously, also, these cover elements also serve as efficient braces for the structure of the scraper.

A draft bridle **49** in the form of a flexible chain has its ends secured between the draft plates **50** and **51** at the forward sides of the scraper body, said chain passing thence around pulleys **52** in a draft frame **53** arranged forward of the central portion of the scraper and connected with a draft element **54** by means of a shackle bolt **55**. The central portion of the chain **49** is looped around a pulley **56** in a pulley block **57** pivotally connected by a shackle bolt **58** with a clevis **59**, pivotally engaging the shackle bolt **30** between the draft flanges **28** on the forward ends of plow-beam plates **27**. Adjustable split stops **60** are arranged on the chain **49** at opposite sides of the draft frame **53** and additional adjustable stops **61** are arranged on the chain **49** just forward of the pulley block **57** as shown. By this arrangement, an equalizing bridle is provided for the scraper body so constructed and arranged that always a material part of the draft strain is communicated to the central rear plow-like portion of the scraper, and the sides thereof thereby relieved from strain. If one of the sides of the scraper encounters an obstruction, the draft frame **53** will shift on the chain **49** until the opposite stop **60** contacts therewith, whereupon the entire draft force will be distributed between the central connection and the side wall of the scraper on opposite sides of the obstruction, thus tending to free the scraper from the obstruction, or dislodge the obstruction without undue straining of the scraper structure. During normal operations of the scraper, the strains thereon are ordinarily equalized so as to prevent undue strains at any point and thereby permitting the use of lighter plates and material in the scraper structure.

Channelled braces **62** connect the upper forward edges of the plates **40** with the front ends of the plates **27**, and serve to reinforce and stiffen the front end of the structure.

Angle bars **63** are secured to the sides of the forward portions of the plates **27**, as shown, so as to stiffen the plates **27** laterally. A slack chain **54'** is connected as shown between the draft frame **53** and the rear central portion of the scraper so that upon breaking of the draft bridle, the scraper will be returned to the operating hoist for repairs. Perforated plates **64** are also attached to the flanges **44—45** to afford means for connecting a draft element to the rear of the scraper for return movements thereof.

In the modification illustrated in Fig. 3, the inclined plates **24** have been omitted; the rear ends of the plates **27** also omitted, and vertical plates **65** substituted for the plates **24** and converging forwardly from the rear ends of the plates **39** to meet the rear upper ends of the plates **27** as shown. To this end the plates **65** are provided with flanges **66** secured to the flanges **22** at the upper rear edges of the plates **20** and also are provided at their rear vertical edges with vertical flanges **67** secured to the flanges **45** at the rear vertical edges of the walls **35**. A cross-brace **68** is also secured as shown, across the rear of the gap thus formed to reinforce and stiffen the rear of the structure.

In the modification indicated in Fig. 9, the rear and side walls of the bottom portion of the scraper are formed from plates having their rear portions **69** bent into substantially cylindrical form and set at an upward and rearward inclination with their meeting edges secured together by an angle plate **70** constituting a plow-like point for the central portion of the scraper. The outer ends of said plates are formed to constitute forwardly extending vertical walls **71**. By this arrangement a very simple construction capable of economical production may be provided, which will be highly satisfactory for certain uses.

In the modification illustrated in Figs. 10 and 11, combined scraper and bracing elements **72** are extended from the sides of the plates **20** to the forward portions of the plates **36** and substantially parallel to the plates **35**. Additional combined scraping and bracing elements **73** are extended from the elements **72** to the plates **35** substantially parallel to the plates **20**. By this arrangement the scraper structure is endowed with additonal scraping elements and the structure reinforced and stiffened thereby.

In the modification indicated in Figs. 12, 13 and 14, plow-like plate **74** is substituted for the plate **21**, and provided with a point extending forwardly and downwardly well below the edges of the plates **20**, so as to accentuate the digging action at this point. Digging teeth have also been added to the walls **35**. Each of these digging teeth comprises a plate having a downwardly and forwardly pointed portion **75** secured to the corresponding plate **35** and forming a substantial continuation thereof and a vertical flange **76** constituting a reinforcing and stiffening element for the pointed portion **75**. A combined brace and digging element has also been added at the front of each side of the scraper. This element comprises a rear downwardly and forwardly extending pointed portion **77** secured to the corresponding wall **35** to form a substantial

continuation thereof and a vertical flange portion 78 secured to the corresponding wall 36 forming a substantial continuation thereof. Guide plates 79 are also detachably secured between plates 64 to depend therefrom and serve as guides. By means of these additions the digging effect of the scraper may be greatly increased for use in relatively hard or difficult deposits and the forward side walls reinforced and stiffened.

While I have illustrated and described the preferred forms of construction for carrying the invention into effect, these are capable of variations and modifications without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details disclosed, but desire to avail myself of such variations and modifications as fall within the scope of the appended claims.

I claim:

1. The combination with a scraper body of a flexible draft bridle secured at its ends to the sides of said body; a draft frame having two freely moving connections with said bridle, the portion of said bridle between said connections being looped and given a freely moving connection with the central portion of the scraper body; and means for connecting said draft frame with a draft member.

2. The combination with a scraper body of a flexible draft bridle secured at its ends to the sides of said body; a draft frame having two freely moving connections with said bridle, the portion of said bridle between said connections being looped and given a freely moving connection with the central portion of the scraper body, means for connecting said draft frame with a draft member; and a stop on said bridle at each side of said frame.

3. The combination with a scraper body of a central pulley connected with the central portion thereof; a central draft frame located forward of said pulley and provided with two co-operating pulleys; and a flexible draft bridle attached to the sides of the scraper body at their upward ends and passing over said frame pulleys and looped around said central pulley.

4. The combination with a scraper body of a central pulley connected with the central portion thereof; a central draft frame located forward of said pulley and provided with two co-operating pulleys, a flexible draft bridle attached to the sides of the scraper body at their upward ends and passing over said frame pulleys and looped around said central pulley; and a stop on said bridle at each side of said draft frame.

5. A scraper comprising a central plow-like element and scraper elements at the sides thereof adapted and arranged to gather material dug thereby; and separately adjustable load limiting cover elements in the side portions of said scraper.

6. A scraper comprising a central scraper element having sides converging upwardly to a point; and side walls extending forwardly and divergently from the rear extremities of the sides of said central element; and separately adjustable load limiting cover elements in the side portions of said scraper.

7. The combination with a scraper body of a flexible draft bridle element secured to the forward end of each side of said body; a draft frame having a freely movable connection with each of said bridle elements, the free end of each of said bridle elements being connected with the central portion of the scraper body; and means for connecting said draft frame with a draft member.

LESLIE P. GREEN.